

Section VIII, Division 2 Class 1 Construction



Section VIII, Division 2

Addition of Class 1 Construction

- Section VIII, Division 2 intended for construction of custom engineered pressure vessels
- Primarily servicing the Petrochemical Industry
- In 2017 Edition, second class of construction [Class 1] added to Section VIII, Division 2
- Construction to the current VIII-2 requirements will be called Class 2
- Many VIII-1 Certificate Holders will likely acquire VIII-2 Stamps as a result of this change



Section VIII, Division 2

Addition of Class 1 Construction

- Class 1 reduces certain VIII-2 requirements such that it will become a more competitive option to VIII-1
- Key difference is elimination of certification of UDS and MDR by a Registered Professional Engineer for vessels exempt from fatigue evaluation
- Let's look at a comparison between Class 1 and Class 2



Section VIII, Division 2

Class 1 versus Class 2

FEATURE	CLASS 1	CLASS 2
Margin on UTS Allowable Stresses	3.0	2.4
Materials	Same as Class 2 except 25 materials not permitted	No change to list of available materials
Design Requirements	Same as Class 2, except not permitted to use Part 5 to overrule Part 4	Part 4 or Part 5
Toughness Requirements	Use same impact test exemption curves; Adjustment to low stress reduction curves to reflect difference in margin on UTS	
Certification of UDS per Annex 2A	Only required when fatigue analysis must be performed	Always required
Certification of MDR per Annex 2B	Only required when fatigue analysis must be performed, and when Part 5 is used because Part 4 does not contain rules	Always required
Fabrication	No difference from Class 2	

Section VIII, Division 2

Class 1 versus Class 2

FEATURE	CLASS 1	CLASS 2
NDE VIII-2 Table 7.2	No difference from Class 2	
Pressure Tests – Part 8	No difference from Class 2	
Overpressure Protection	No difference from Class 2	

Summary - Design Differences Between VIII-1, Case 2695, VIII-2 Class 1 and 2

- Scope of VIII-1 very broad
- Mass produced vessels such as air receivers, propane tanks
- Process vessels such as tanks, H/X, towers, reactor vessels, unfired steam boilers
- Vessels constructed to special materials, such as graphite, cast iron, materials for ultra low temperature
- VIII-1 is a simple code using design-by-rule only and large design margin on UTS
- VIII-2 intended to service the petrochemical industry
- Two classes of construction with higher design margins on UTS (3.0 and 2.4)
- Design-by-Rule and Design-by-Analysis options
- Requirements for material selection, fabrication, NDE, inspection & testing all focused on the needs of petrochemical industry
- Pressure equipment constructed to VIII-2 will be most efficient in terms of weight for a given P/T and fabrication cost